



JSC Photo 97e00990  
Texas A&M University students Shannon Bragg, center left, and DeLeah Lockridge, center right, fly with their experiment, the Microgravity Phase Separation in a Fixed Cylinder, that examined how gases separate in microgravity. A two phase system could provide improved operation and efficiency compared with analogous single phase systems currently in use, thus reducing power requirements and mission costs.

# Weightless Wonders

## KC-135 student flight phase ends, outreach activities begin

By Donn Sickorez

After five days of flight training, and six straight days of flying parabolas, the flight phase of the summer 1997 NASA Reduced Gravity Student Experiment Program is complete.

Friends, relatives, team members and others crowded around the aircraft April 19 to welcome the last group of new fliers home and swap tales of weightlessness and experiment performance.

The program was created to provide professional growth, technical challenges and outreach opportunities to U.S. students from colleges and universities. They came from as near as Texas A&M and as far as Michigan and Oregon and converged on Ellington Field's hangar 990 in mid-April to experience what was, for many, the highlight of their educational experience.

Twenty-three teams of students (together with their team journalists) flew experiments aboard the KC-135 microgravity-simulating aircraft. All experiments generated useful data—sometimes to the amazement of the fliers—and that data will be reduced, analyzed and translated into useful products in the months ahead.

The flight phase—a collaboration among Ellington's Reduced-Gravity Office, JSC's Education and Outreach Branch, and the Texas Space Grant Consortium—was an unqualified success for the student fliers. Shannon Bragg, a senior at Texas A&M University, echoed the sentiments of all of the fliers when she said that participating in the program allowed her and her team to experience all aspects of research.

"This is a program that I think should be continued," Bragg wrote. "The experience was amazing and I wouldn't trade it for the world and I'd jump at the chance to do it again. I learned an incredible amount about engineering in the real world as well. Designing projects on paper are one thing, putting one together is a different story. I ran into all kinds of issues—obtaining funds, working with suppliers, difficulties with my teammates, varying 'work ethics' and priorities of group members, etc. Things don't go quite as smoothly as one would hope. I put an inordinate amount of time into getting this project ready, but it was really worth it. I just consider the practical experience I gained—I have highly recommended the program to my colleagues."

Andrew Davidhazy of the Rochester Institute of Technology's was one of the students' mentors.

"The purpose of our experiment was not so much to add significant new knowledge to the scientific database but rather to solve a difficult engineering problem and to learn how one goes about solving the various technical, environmental and scientific problems one encounters along the way," he said. "One does not often get a chance to attempt to solve difficult problems under unusual conditions. This was our chance. In a

way, a project like this allows its participants to stretch their minds and exercise their imagination, educational preparation and innovative thinking so that one is better able to solve yet unforeseen problems in the future."

"This experience excited me even more about research and showed me that I wouldn't be stuck in a classroom for the rest of my life," said Jodi James of Hope College. "I am intrigued about the health concerns for space travel and want to work on finding answers and solving those problems. If anything this experience inspired me and motivated me to work even harder in academia."

Program focus is now shifting to the outreach phase, which benefits wider audiences—both students and the general public. Already, outreach activities have begun.

"The interest here this week is amazing," wrote Suzanne Smith, faculty mentor from the University of Kentucky last month. "The UK paper did a half-page cover story with the photos NASA had on the FTP (File Transfer Protocol) site on Tuesday. Our four-part TV news series runs tonight and tomorrow, but there were two preliminary stories that aired yesterday. With CNN and Discovery stories running and other activities here we are really getting quite a bit of good attention. I hope we can build on that in my program and the college."

"The fliers came back heroes to everyone on the reservation," said Ed Galindo, mentor of the Utah State/Shoshone-Bannock team from Idaho. "So many people from the community and the reservation school asked for a presentation that we are scheduling a general assembly at the reservation school next Tuesday, to try to accommodate some of the requests."

Galindo added that such heroes are important to the elementary students because they contradict stereotypes of Native Americans.

"For the first time in some of these young students' lives," Galindo said. "They are face-to-face with Native Americans who are successful in science and math. It's the beginning of the realization that they can be successful, too."

Lila Engle from Northern Arizona University expressed gratitude to Burke Fort, program manager for the Texas Space Grant Consortium; JSC Director George Abbey; Bob Williams and Judy Rickard, KC-135 test directors; Donn Sickorez, JSC's university affairs officer; and Jo Anne Banks, administrative assistant at Ellington Field.

"Thank you," said Engle. "To Burke for designing the opportunity, to Bob and Judy for your outstanding patience, to Donn for a wealth of information and to Mr. Abbey for opening JSC to an unruly bunch of students. Thank you to the staff of JSC/Ellington Field. You're wonderful. And thank you Jo Anne for keeping it all running smoothly."

Results from this program will be linked to <http://www.tsgc.utexas.edu/tsgc/floatn.html>



JSC Photo 97e00976  
University of Utah students Darren Kimoto and Lisa Book fly with a physical model of the cardiovascular system to examine the reduction in stroke volume inside the heart's ventricles.



JSC Photo 97e01036:  
Facing the camera, from left, the University of Texas at Austin student Jessica Regner, Jim Wilson, Texas Space Grant Consortium, program manager and UT student Daniel Luna keep an eye on the Quark Search experiment. This experiment is trying to determine whether or not it is feasible to place small metal spheres in microgravity and test for fractional charging.



JSC Photo 97-04906  
From left, KC-135 Test Director Judy Rickard answers questions from JSC Assistant Director, Technical Tom Akers and JSC Director George Abbey about the students experiments.



JSC Photo 97e01009  
Crystal Embry of Rochester Institute of Technology observes and records the distribution of liquid in a zero gravity environment during the process of rupturing a balloon. This experiment examined how different liquids respond to the disintegration of the rubber shell.

JSC Photos by Robert Markowitz and Hector Gongora



JSC Photo 97e01031  
Students from the University of Texas at Austin, Embry-Riddle Aeronautical University, University of Washington, Utah State University/Shoshone-Bannock School, Louisiana State University and Pomona College assemble for a group photo after the final flight of the program.